

REMARKS/ARGUMENTS

This is in full and timely response to the Office Action mailed March 14, 2003 (Paper No. 8). The Title was amended to recite Cathode For An Electron Emission Device, Cold Cathode Field Emission Device And Method For The Production Thereof, And Cold Cathode Field Emission Display And Method For The Production Thereof Having A Carbon Film Selective Growth Region. Claims 1, 2, 4, 5, 11, 75 and 76 were amended. Support for the carbon film selective-growth region can be found variously throughout the specification, for example, the original claims and See page 10, line 36 to page 11, line 9. Support for the first and second gates, first and second insulating layers, and first through third portions of the cathode electrode and be found variously throughout the specification, for example, at Figs. 6-8. No new matter was added. Claims 1-79 are pending in this application, with claims 1-13 and 74-76 pending for the Examiner's reconsideration, with claims 1, 2, 5, 14, 34, 54 and 74-79 being independent. Reexamination and reconsideration in light of the above amendments and the following remarks is respectfully requested.

Election/Restriction:

Applicants affirm the election of claims 1-13 and 74-76 apparatus claims with traverse.

Drawings:

The Office Action objected to the drawings for allegedly not showing the acicular shape recited in claims 12 and 13. Applicants respectfully traverse this objection.

Example 13, which is a variant of the production method of the field emission device of example 6 discussed in the specification, clearly recites that "the metal particles adhering onto the surface of the cathode electrode has an acicular form." Page 73, lines 29-33. Example 6 clearly identifies the metal particle as part 21 in Fig. 11B. Accordingly the metal particles 21 are clearly identified in the figures, especially for example in Fig. 11B. There is no requirement that a description of a shape, in this case acicular, be depicted in the figures. As the part, namely the metal particles 21, is shown in the figures, and the part is adequately described in the specification, for example at page 25, line 31 to page 26, line 25, all requirements have been met. Withdrawal of this objection is respectfully requested.

Claim Objections

Claims 4 and 11 are objected to regarding the first and second openings. The Office Action states that these opening were interpreted as "the first opening being the opening between the gate electrodes and the second opening being between the insulating layers below the gate electrodes." Applicants affirm this interpretation, and have variously amended the claims 2, 4, 5, 11, 75 and 76 to reflect this. Withdrawal of this objection is respectfully requested.

Rejections under 35 U.S.C. §102

Claims 1-4 and 74-76 are rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,726,524 to Debe. Applicants respectfully traverse this rejection.

Claim 1 recites an electron emission device comprising; (a) a conductive layer with a carbon film selective-growth region formed on a surface thereof, and (b) an electron emitting portion composed of a carbon film formed on the carbon film selective-growth region, wherein the carbon film selective-growth region is a portion of the conductive layer onto which at least one of metal particles, metal thin layer and organometallic compound thin layer adhere.

Claim 2 recites a cold cathode field emission device comprising; (a) a cathode electrode formed on a supporting substrate; (b) a first gate electrode formed above a first portion of the cathode electrode; (c) a second gate electrode formed above a second portion of the cathode electrode, the second portion of the cathode electrode separated from the first portion of the cathode electrode by a third portion of the cathode electrode; (d) a first opening portion between the first gate electrode and the second gate electrode; and (e) an electron emitting portion having a carbon film formed on a surface of the third portion of the cathode electrode.

Claim 74 recites a cold cathode field emission display comprising a plurality of pixels, each pixel comprising a cold cathode field emission device, an anode electrode and a fluorescent layer, the anode electrode and the fluorescent layer being formed on a substrate so as to be opposed to the cold cathode field emission device, and the cold cathode field emission device comprising; (a) a conductive layer with a carbon film selective-growth region formed on a surface thereof, and (b) an electron emitting portion composed of a carbon film formed on the carbon film selective-growth region.

Claim 75 recites a cold cathode field emission display comprising a plurality of pixels, each pixel comprising a cold cathode field emission device, an anode electrode and a fluorescent

layer, the anode electrode and the fluorescent layer being formed on a substrate so as to be opposed to the cold cathode field emission device, and the cold cathode field emission device comprising; (a) a cathode electrode formed on a supporting substrate; (b) a first gate electrode formed above a first portion of the cathode electrode; (c) a second gate electrode formed above a second portion of the cathode electrode, the second portion of the cathode electrode separated from the first portion of the cathode electrode by a third portion of the cathode electrode; (d) an opening portion between the first gate electrode and the second gate electrode; and (e) an electron emitting portion having a carbon film formed on a surface of the third portion of the cathode electrode.

Claim 76 recites a cold cathode field emission display comprising a plurality of pixels, each pixel comprising a cold cathode field emission device, an anode electrode and a fluorescent layer, the anode electrode and the fluorescent layer being formed on a substrate so as to be opposed to the cold cathode field emission device, and the cold cathode field emission device comprising; (a) a cathode electrode formed on a supporting substrate; (b) a first gate electrode formed above a first portion of the cathode electrode; (c) a second gate electrode formed above a second portion of the cathode electrode, the second portion of the cathode electrode separated from the first portion of the cathode electrode by a third portion of the cathode electrode; (d) an opening portion between the first gate electrode and the second gate electrode; (e) a carbon film selective-growth region formed at least on a surface of the third portion of the cathode electrode; and (f) an electron emitting portion having a carbon film formed on the carbon film selective-growth region.

The claim term "carbon film selective-growth region" is defined variously throughout the specification. For example, the carbon film selective-growth region is that "portion of the conductive layer or the cathode electrode onto a surface of which portion metal particles adhere, or that portion of the conductive layer or the cathode electrode on a surface of which portion a thin metal layer or an organometallic compound thin layer is formed. For making the selective growth of the carbon film on the carbon film selective-growth region more reliable, desirable, the surface of the carbon film selective-growth region has sulfur (S), boron (B) or phosphorus (P) adhering thereto." See page 10, line 36 to page 11, line 9.

Debe '524 discloses an electric field emission device whereby the cathode electrode has a microstructure layer conformally coated with one or more layers of an electron emitting material, the overcoated material being disposed on at least a portion of the microstructures.

The office action alleges that the carbon film 38 is the claimed carbon film selective-growth region. Applicants disagree, as nowhere in Debe '524 is such a carbon film selective-growth region disclosed, taught or suggested. Rather, Debe '524 discloses depositing the carbon film 38 on the conductor 40 without any such growth region as discussed above.

A document can only anticipate a claim if the document discloses, explicitly or implicitly, each and every feature recited in the claim. Verdegall Bros. v. Union Oil Co. of Calif., 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Since Debe '524 fails to disclose, either explicitly or implicitly, at least the above-noted features recited in independent claims 1, 2 and 74-76, Debe '524 cannot anticipate the claims. At least in view of the foregoing, claims 1, 2 and 74-74 are allowable, and the rejection should be reconsidered and withdrawn.

Dependent claims 3 and 4 depending from claim 1, are also allowable for the reasons above. Moreover, these claims are further distinguished by the materials recited therein, particularly within the claimed combination. Withdrawal of the §102(b) rejection is therefore respectfully solicited.

Claims 5-13 are rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,608,283 to Twichell et al. Applicants respectfully traverse this rejection.

Claim 5 recites a cold cathode field emission device comprising; (a) a cathode electrode formed on a supporting substrate; (b) a first gate electrode formed above a first portion of the cathode electrode; (c) a second gate electrode formed above a second portion of the cathode electrode, the second portion of the cathode electrode separated from the first portion of the cathode electrode by a third portion of the cathode electrode; (d) a first opening portion between the first gate electrode and the second gate electrode; (e) a carbon film selective-growth region formed at least on a surface of the third portion of the cathode electrode; and (f) an electron emitting portion having a carbon film formed on the carbon film selective-growth region.

The claim term "carbon film selective-growth region" is defined variously throughout the specification. For example, the carbon film selective-growth region is that "portion of the conductive layer or the cathode electrode onto a surface of which portion metal particles adhere, or that portion of the conductive layer or the cathode electrode on a surface of which portion a thin metal layer or an organometallic compound thin layer is formed. For making the selective growth of the carbon film on the carbon film selective-growth region more reliable, desirable, the

surface of the carbon film selective-growth region has sulfur (S), boron (B) or phosphorus (P) adhering thereto." See page 10, line 36 to page 11, line 9.

Twichell et al. '283 discloses an electron emitting device utilizing electron-emissive particles which typically contain carbon. However, Twichell et al. '283 do not disclose, teach or suggest a carbon film selective-growth region as claimed. Rather, Twichell et al. '283 discloses depositing carbon carbon-containing particle 22 on an area 20. The area 20 is not the carbon film selective-growth region as claimed discussed above.

A document can only anticipate a claim if the document discloses, explicitly or implicitly, each and every feature recited in the claim. Verdegall Bros. v. Union Oil Co. of Calif., 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Since Twichell et al. '283 fails to disclose, either explicitly or implicitly, at least the above-noted features recited in independent claim 5, Twichell et al. '283 cannot anticipate the claim. At least in view of the foregoing, claim 5 is allowable, and the rejection should be reconsidered and withdrawn.

Dependent claims 6-13 depending from claim 5, are also allowable for the reasons above. Moreover, these claims are further distinguished by the materials recited therein, particularly within the claimed combination. Withdrawal of the §102(b) rejection is therefore respectfully solicited.

Conclusion

For the foregoing reasons, claims 1-13 and 74-76 are allowable, and the present application is in condition for allowance. Accordingly, favorable reexamination and reconsideration of the application in light of these amendments and remarks is courteously solicited. If the examiner has any comments or suggestions that would place this application in even better form, the Examiner is requested to telephone the undersigned attorney at the number below.

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Respectfully submitted,

By _____

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